DOCUMENT RESUME

ED 201 499 SE 034 836

AUTHOR Arnold, Cheryl A.
TITLE Injuries and Illnesses in Outdoor Education: A Study of an Ohio Upper-Elementary Resident Outdoor Education Program.
PUB DATE 81
NOTE 76p.; An Honors Project presented in partial fulfillment of the requirements for the Degree Bachelor of Science, The Ohio State University. Not available in hard copy due to copyright restrictions.

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS Accident Prevention; Camping; *Diseases; Elementary School Students; *Environmental Education; Field Trips; *Injuries; Intermediate Grades; Outdoor Activities; *Outdoor Education; *Resident Camp Programs; Safety
IDENTIFIERS Environmental Education Research

ABSTRACT

Reported is a study of illnesses and injuries occurring during resident outdoor education programs at Camp Joy, Cincinnati, Ohio. The study involved an analysis of the nurse's and supervisor's records compiled during 12 one-week resident sessions with fourth, fifth and sixth graders from Cincinnati public schools (N=1271). The 71 injuries and 58 illnesses that occurred are described by season, location, event, nature of activity, and nature of illness or injury. Frequency and percentage calculations performed upon these data form the basis for conclusions regarding the incidence of injuries and illnesses by sex, season, nature of activity, and type of illness or injury. Also presented are recommendations for reducing the frequency of illnesses and injuries in resident outdoor education programs. (Author/WB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED201499

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Cheryl A. Arnold

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

INJURIES AND ILLNESSES IN OUTDOOR EDUCATION:

A Study of an Ohio Upper-Elementary Resident Outdoor Education Program

An Honors Project

Presented in Partial Fullfillment of the Requirements
for the Degree Bachelor of Science

by

Cheryl A. Arnold

The Ohio State University
1981

Approved by:

_____
Adviser

School of Natural Resources

Copyright © 1981
by Cheryl A. Arnold
All rights reserved

SE 034 886

ABSTRACT

INJURIES AND ILLNESSES IN OUTDOOR

Education: A Study of an Ohio Upper-Elementary

Resident Outdoor Education Program

(March 1981)

Cheryl Ann Arnold, The Ohio State University

Resident outdoor education programs have established safety and health as one of their objectives. In order to achieve this objective many resident outdoor education programs follow, to varying degrees, safety and health standards which are both required by law and suggested by organizations such as the American Camping Association. Little research has been done which focused on the safety and health aspects of resident outdoor education programs.

This study assessed injuries and illnesses that occurred during Camp Joy's resident outdoor education program which is located in Cincinnati, Ohio. The study conducted in 1981, involved the nurse's and supervisor's records of injuries and illnesses during the 1979-80 school year.

Description and explanation of the data set was conducted and the results were as follows:

1) Injuries that occurred were more likely in male than female participants, and illnesses were more likely in females than in male participants.

2) More participants were injured during the fall than in the winter or spring, and more participants were ill in the spring than in the fall or winter.

3) More injuries occurred during unsupervised activities than during supervised activities.

4) Most injuries were of minor nature such as cuts or punctures, bruises, and other or unknown types.

5) Most illnesses which occurred were either allergic diseases, or illnesses of other conditions such as undiagnosed fever.

ACKNOWLEDGEMENTS

I can't believe this is the end of four years of work—but thanks to many wonderful people, hear it is. Without the time, support, and assistance I recieved from many people this paper could not be a reality.

First, I would like to thank my advisor Dr. Mary Lynne Bowman-Cowen for being a great advisor, friend, and incentive provider. Your help and confidence in my abilities has added to my project, and made the whole task easier. THANK YOU!

Next, I would like to thank my committee, Dr. Robert Touse, Dr. Clint Shepard, and Dr. Mary Lynne Bowman-Cowen. All of you have been very understanding and willing to help me in any way possible--including the acceptance of my deadlines. Your ideas and suggestions have made my final draft more understandable and of higher quality. I thoroughly enjoyed my oral examination with all three of you.

I owe the success of much of my paper to Dr. Gary Mullins and Debbie Griest who wrote my SPSS program. They took time from their full schedules to give me assistance and the skills necessary to complete a task which I could never have accomplished alone. Thanks for being there when I needed you both.

A big thank you goes to Mr. Gene Knight, the director of Camp Joy, who was cooperative in every way possible. He trusted me and provided all the information necessary for my research.

There are several other people who are very close to me who diserve equal thanks. I truly appreciate my parents support—especially you mom, who spent hours typing from a rough copy. Without both of you this day would

have never become a reality. One down, two to go. And last but not least, John R. Lane, my husband-to-be, provided the glue to hold me together throughout this difficult and time consuming task. Thanks for taking care of me John R..

TABLE OF CONTENTS

ABSTRACT ii

ACKNOWLEDGEMENTS iii

TABLE OF CONTENTS v

LIST OF FIGURES vii

LIST OF TABLES viii

CHAPTER

I INTRODUCTION 1

Problem Statement 3
Need for Study. 4
Statement of Research Objectives. 6
Related Task. 7
Limitations of Study. 7
Definition of Terms 8

II REVIEW OF THE LITERATURE 10

Overview of Resident Outdoor Education 10
Injury and Illness Studies. 13
Safety and Health in Resident Outdoor Education 19
Established Standards and Regulations 19
Administrative Standards 21
Program Planning 23
Site Planning 25
Evaluation 26
Summary 27

III RESEARCH DESIGN AND METHODOLOGY 29

Statement of Research Objectives 30
Design Considerations 30
Data Collection 32
Data Set 32
Data Collection Sheets. 33
Data Analysis 34
Summary 34

IV RESULTS 35

Description of the Data Set 35
Injury and Illness Frequencies 36
Injury Frequencies. 36
Illness Frequencies 39

Injury and Illness Crosstabulations 41
Injuries by Season 41
Injuries by Supervised/Unsupervised Activities 44
Illnesses by Season 47
Summary 48

V. DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS 50

Discussion 50
Injuries 50
Illnesses 55
Conclusions 58
Recommendations 59
Further Research 59
Implications 60

LITERATURE CITED 62

APPENDIX A 65

Oct 7

LIST OF FIGURES

Figure		Page
1	Youth Camp Morbidity/Mortaility Data	14

LIST OF TABLES

Table		Page
1	Compositon of the Data Set	35
2	Descriptions of Injuries Occurring in the Data Set	36
3	Description of Illnesses Occurring in the Data Set	37
4	Description of Injury by Season in Terms of Location of the Injury	39
5	Description of Injuries by Season in Terms of the Event Causing the Injury	42
6	Description of Injuries by Supervised/Unsupervised Activity in Terms of Location of Injury	43
7	Description of Injuries by Supervised/Unsupervised Activity in Terms of Event Causing the Injury	45
8	Description of Illnesses by Season in Terms of Allergice Disease	46
9	Description of Illnesses by Season in Terms of Other Conditions	47

CHAPTER I

INTRODUCTION

> "Every child should have mud pies, grasshoppers, water bugs, tadpoles, frogs, mud turtles, elderberries, wild strawberries, acorns, chestnuts, trees to climb, brooks to wade in, water lilies, woodchucks, bats, bees, butterflies, various animals to pet, hay fields, pine cones, rocks to roll, sand, snakes, huckleberries, and hornets, and any child who has been deprived of these has been deprived of the best part of his education" (25).

The purpose of a resident outdoor education program is to provide a setting for curricular experiences that cannot be offered, or achieved as readily within the confines of a school building. Resident outdoor education complements, "... in a way that indoor instruction cannot, the aims of education" (10) .

There is no single set of criteria for defining or identifying outdoor education programs. Volumes have been written defining outdoor education, and many others have attempted to analyze the numerous existing definitions (26). Arthur Lucas (19) compiled a descriptive definition to explain the usage of environmental education, which is used synonymously with outdoor education, by reflecting on the current usages of the term. Lucas' study (19) does not add yet another definition, but rather it covers the range of definitions used for environmental education. Lucas states, "... the term 'environmental education' can be classified into education <u>about</u> the environment, education <u>for</u> the environment, education <u>in</u> the environment, and the classes formed by the combinations <u>about</u> and <u>for</u>, <u>about</u> and <u>in</u>, <u>for</u> and <u>in</u>, and <u>about</u>, <u>for</u>, and <u>in</u> the environment" (20). Education <u>about</u> the environment is concerned with providing cognitive under-

standing, including the skills to obtain this understanding (19) . This includes facts about the environment, comprehension, and interpretation of environmental data, and analysis of environmental situations (19) . Education for the environment is directed to environmental preservation or improvement for particular purposes including attitudes of concern for the environmental features on which human life depends (19). Both education about the environment, and education for the environment, are characterized by program goals (19). Education in the environment which is characterized by a technique of instruction, refers to any program which takes place in the out-of-doors environment (19). Resident outdoor education programs make use of education in the environment to teach either or both about the environment and/or for the environment.

A recent study conducted by the American Camping Association shows that camp use in the fall, winter, and spring for outdoor education has increased almost fifty percent in the last seven years (32). While safety and health are included in the goals of most resident outdoor education programs (3, 5, 7, 22, 25, 27), limited research has been done to assure that this goal is being met.

The goal of this study is to gather information through the use of injury and illness report forms to expand upon knowledge about health and safety considerations for resident outdoor education programs. The purpose of this study is two fold:

(1) To assess injuries and illnesses occurring among upper elementary level students in Camp Joy's Resident Outdoor Education program.

(2) To describe and explain injuries and illnesses reported in terms of season of participation, location, event, nature of activity, and nature

of injury or illness.

Problem Statement

Since 1966 there has been a congressional interest in youth camp safety and health (18). There have been efforts to pass a Youth Camp Safety Act in Congress, and although the bill has been reintroduced each session since 1968, it has never passed both Houses in the same session. As a result of this federal interest, six studies have been done which concern youth camp safety and health by two federal agencies (18). The Department of Health Education, and Welfare studied serious injuries and illnesses in 1973 and found low morbidity rates and no mortalities (18). The Center for Disease Control in Atlanta has conducted three studies in 1975 and 1976 related to the 1973 study with similar findings (18). In addition, this Center for Disease Control has conducted a study from 1976 to 1979 on fatalities that occur in resident camps (18). The results of these six studies show that camp safety and health is far better than national levels as reported by the National Safety Council (33). Although these studies are of significance on a national level, no attempt has been made to judge the safety of camps or program adequacy.

While all states have some regulations which affect camps, they are generally minimal and limited to health and sanitation which is governed at the county or city level in each state (33). There are no mandatory federal health and safety regulations which affect resident outdoor education programs (33), but there are suggested regulations compiled by both the American Camping Association (35), and the Center for Disease Control (36).

There are seventeen states that have comprehensive safety and health laws affecting resident outdoor education centers, and camps in the remaining thirty-three states may or may not follow these suggested regulations (33). Although safety and health regulations are not often mandatory, most resident outdoor education programs list safety and health among the program objectives, and follow to some degree suggested safety and health regulations (3, 5, 7, 22, 25, 27).

Survey instruments which have been proposed to evaluate environmental education program objectives have included cognitive and affective aspects of the program, and ongoing evaluation procedures, but no mention is made of safety and health aspects in these evaluation procedures (1). Since on-going evaluation of program objectives should be a part of all educational programs, there is a need for an instrument to evaluate the safety and health aspects of resident outdoor education programs, as well as all other program objectives. This study seeks to aid in developing a method for evaluation of the health and safety aspects of resident outdoor education programs.

Need for Study

Approximately 3,000 resident camps in the United States offer fall, winter, and spring programs in which school systems work with camps to provide resident outdoor education for school children (33). One of the most rapid growth areas in camping has been this type of off-season use (33). In the last seven years the capacity of camps operating in the fall, winter,

and spring has more than doubled, and is predicted to continue increasing (33). One study estimates that our camping population may triple by the year 2000 (4). In view of this rapid expansion of resident outdoor education programs, care should be taken to insure that the programs offered are safe and healthful for the participants involved.

In recent years there has been a growing interest in youth camp safety and health in both the federal government and the American Camping Association. There has been congressional interest in youth camp safety and health since 1966 when bills were first introduced to create a federal role in this program area (18). Although no legislation has met successful passage, this federal interest has spawned six studies of statistical nature concerning serious injuries and illnesses in resident camps which have aided Congress in determining the need for this type of legislation. One other study, of a different nature, was sponsored by the American Camping Association and conducted by a Registered Nurse with forty years of camp nursing experience. Her results indicate a need for further research to pinpoint problem areas in health and safety in resident camping programs (24). These seven studies are discussed in detail in the review of the literature. Results of these studies are of a broad nature, and therefore useful mainly for statistical comparisons. They indicate a growing interest in the analysis of illnesses and injuries at camp, and suggest that further research of an evaluative nature will be necessary to judge the safety and health aspects of any particular program.

There is a concern for the health and safety of children participating in resident outdoor education programs on both the part of camp and school

administration. Roth and Helgeson (28) conducted a review of research related to environmental education which included administrative concerns. They found that administrative problems in the last twenty years had been relatively consistent. A summary of nine major administrative concerns ranked safety and health as number four (28). Teachers and school administrators have verbally expressed concern about possible safety and health problems that may potentially occur at camp. Some schools have declined to become involved in resident outdoor education programs because of potential hazards and liabilities that may ensue (16).

These concerns illustrate a need for research that can evaluate the safety and health aspects of resident outdoor education programs. This study will develop a means for describing and explaining the types of injuries and illnesses that occur in resident outdoor education programs. The results of this study, may, as a consequence, have significance for camp and school administrators concerned with program planning, site planning, and program evaluation.

Statement of Research Objectives

The following objectives guided this study:

(1) To assess and investigate relationships in the injury and illness records of upper elementary students attending Camp Joy's resident outdoor education program in the fall, winter, and spring.

(2) To describe and explain injuries by season in terms of location, event causing the injury, and type of injury.

(3) To describe and explain injuries by nature of the activity in terms of location, event causing the injury, and type of injury.

(4) To describe and explain illness by season, in terms of frequency, and diagnosis of the illness.

Related Task

A related task for the achievement of these objectives is the development of an instrument to assess injuries and illness in resident camping programs.

Limitations of Study

Five Ohio resident outdoor education program directors are to be contacted for this study. They include:

(1) Mr. Edward Kramer, Director of Grant Nature Center, Centerville, Ohio (17).

(2) Mr. Ned Mosher, Outdoor Education Coordinator for Westerville City Schools, Columbus, Ohio (23).

(3) Mr. Dean Freund, Outdoor Education Coordinator for Worthington Public Schools, Columbus, Ohio (8).

(4) Mr. Kent Barnheiser, Director of YMCA Camp Kern, Oregonia, Ohio (2).

(5) Mr. Gene Knight, Director of Camp Joy, Cincinnati, Ohio (16).

Although all of these resident camps use some method of recording injuries and illnesses (2, 8, 16, 17, 23), only Camp Joy (16) has records that are standardized and accurate enough to be useful for this study. The remaining resident camps' (2, 8, 17, 23) records were too diverse to fit

the needs of this study, and could not be utilized for statistical evaluation.

Definition of Terms

(1) Camp and Camping "-- as set forth by the American Camping Association-- Camping is a sustained experience which provides a creative, recreational and educational opportunity in group living in the out-of-doors. It utilizes trained leadership and the resources of natural surroundings to contribute to each camper's mental, physical, social and spiritual growth" (35).

(2) Resident Camping "-- a sustained experience which provides a creative, recreational and educational opportunity in group living in the out-of-doors in which campers live at one site two or more consecutive nights. It utilizes trained leadership and the resources of natural surroundings to contribute to each camper's mental, physical, social and spiritual growth" (35).

(3) Outdoor Education -- can refer to education <u>about</u> the environment, <u>for</u> the (preservation of the) environment, or <u>in</u> the environment. Any of these can be combined (19). Outdoor education is used synonymously with environmental education in the context of this paper.

(4) Resident Outdoor Education -- a resident camping program which is characterized by the methods it employs, and its goals and content. The learning methods employed require the total involvement of participants utilizing problem solving, experiencing first hand, and exploring, discovering, and observing using all the senses. The content and

goals are characterized by multi-disiplinary curriculum enrichment of which knowledge is an expected outcome (26).

(5) Program-- the period during which the participants are at the resident outdoor education center.

(6) Curriculum-- the courses or areas of study which are offered in the resident outdoor education program.

(7) Upper Elementary-- grades four, five, and six.

(8) Participants-- upper elementary students involved in a resident outdoor education program. This excludes teachers, counselors, and all camp personnel.

CHAPTER II

REVIEW OF THE LITERATURE

There are three broad areas of related literature which furnish the groundwork for this study. The first section deals with an overview of resident outdoor education. A brief history of resident outdoor education is provided along with an overview of the definition, objectives, and safety and health aspects of the program. The second area focuses on injury and illness studies that are related to resident camping. The final section deals with the established safety and health aspects of resident outdoor education.

Overview of Resident Outdoor Education

Outdoor education is not a new field. Donaldson and Goering state that "All through the history of education one can find references to utilization of the out-of-doors as a means to enhance the learning situation" (7). The first record of a resident outdoor education program was in 1861 when Fredrick W. Gunn, founder and head of Gunnery School for Boys, and his wife took students four miles away to Milford on the Sound in Washington, Connecticut. The school lived there for two weeks engaging in activities such as boating, fishing, hiking, and sailing (4).

School camping began to develop in the late 1920's when L. B. Sharp's doctoral study of the Life Camps demonstrated the value of an outdoor education experience for school children (15). Three post-depression resident outdoor education projects contributed significantly to the initial development of outdoor education in the United States (9). In the early 1940's

the Battle Creek, Michigan resident outdoor education program exerted philisophical influence and provided training for outdoor leaders (9). Another project, the New York City Camping Education Experience, provided a basis for the evaluation of resident outdoor education. A third project of significance was the Tyler, Texas Outdoor Laboratory, which established a pattern for school and community cooperation in resident outdoor education program development (9).

Today, outdoor education has become a recognized part of the school curriculum in much of the United States (9). More recent historically significant developments include the formation of the Outdoor Education Association in 1951, the Elementary and Secondary Education Act of 1965 which provided funds for the development of outdoor education projects in schools, and the 1970's Environmental Education Movement which increased public awareness of the environment through activities such as Earth Day (9).

Outdoor Education has no single definition, purpose, goal or set of objectives. As previously defined, outdoor education is "... education about the environment, for the (preservation of the) environment, or in the environment." Any of these three about, for, or in may be combined (19). This definition is descriptive and explains outdoor education in terms of its usage. Oxford provided a more detailed synopsis of outdoor education definitions and objectives in a 1973 literature review (26). While her reference listing is consistent with Lucas' (19), about, for, and in the environment, it provides more detail concerning the nature of a resident outdoor education program.

Oxford found the definitions of outdoor education to include three factors:

(1) The place where outdoor education occurs is usually a natural environment. This is one of the advantages of resident outdoor education.

(2) The methods that outdoor education employs require total individual involvement in areas such as:

   a. problem solving,

   b. experiencing first hand, and

   c. exploring, discovering, and observing using all the senses.

(3) Its goals and content include:

   a. multidisiplinary curriculum enrichment,

   b. the learning that occurs outdoors is more meaningful, and

   c. that knowledge is an expected outcome (26).

Oxford further includes a review of the objectives of outdoor education. She observed that most objectives included the following aspects:

(1) To provide a first hand learning experience,

(2) A concern about skills, knowledge, and attitudes, and

(3) Some objectives identical to all educational programs, and some unique to outdoor education (26).

Many resident outdoor education programs list safety and health in some sense in their stated objectives (3, 5, 7, 22, 25, 27). Donaldson and Goering (7) in their synthesis of outdoor education list objectives by decade. In

the 1940's, and the 1950's, "learning to live healthfully" (27) is among the stated objectives. Rosenstein and Irwin (27) include the "general health, safety, and welfare" of the participants as an objective in their guide on planning resident outdoor education programs (27).

Specific guidelines for safety and health have been included in many curriculum guides (3, 5, 22, 25, 27). The specific nature of such guidelines will be discussed in the established standards; however, it should be emphasized at this point that some or all of the standards are being followed by resident outdoor education planners (3, 5, 22, 25, 27).

Injury and Illness Studies

There have been relatively few studies done concerning injuries and illnesses in resident camping programs. Six studies were found that were spawned by Congressional interest since 1966 in passing a Youth Camp Safety Act (33). A seventh study was found that was conducted by a registered nurse on the general nature of resident camp injuries and illnesses (18).

Although there have been no successful bills on youth camp safety passed through both houses of Congress in the same term, there has been enough Congressional interest to re-introduce the bill each session since 1968 (33). The six studies have been conducted in an attempt to determine the need for this type of legislation (33). Five of the studies were of similar nature reflecting data on serious injuries and illnesses occurring at camps in several states. The first study (1973) was conducted by the Department of Health, Education, and Welfare through Century Research

Corporation. Findings did not reveal high levels of either morbidity or mortality. The other four studies which related to the first were conducted by the Center for Disease Control in 1975 and 1976. The findings of all the studies were of similar nature and are summarized in the following table:

Youth Camp Morbidity/Mortality Data

Study	No. of Camps	Approximate Number Camper Days	Illnesses per 1,000 Camper Days	Injuries per 1,000 Camper Days	Fatalities
Century Research* Report (1973)	128	640,000	0.29	0.10	0
Washington (1975)**	70	350,408	0.25	0.16	1 (drowning)
Pennsylvania (1975)**	200	1,200,700	0.08	0.11	1 (motor vehicle)
Florida (1975)**	77	285,714	0.17	0.13	0
Florida (1976)**	83	448,465	0.21	0.13	3 (drowning, snakebite, gas inhalation)

* Data reflects serious illnesses and injuries meeting any of the following criteria:

1. camper was sent home,
2. camper was admitted to a hospital,
3. camper suffered permanent partial disability or worse, or
4. camper had laboratory work performed in connection with the illness.

** Data reflects serious illness and injuries meeting the following criteria:

For each injury, illness, or fatality which occurred at camp, and which was attended by a physician or nurse, and as a result of which the child was:

1. sent home, or
2. admitted to a hospital, or
3. had either laboratory analysis or x-rays performed which resulted in positive diagnosis.

Figure 1 -- Youth Camp Morbidity/Mortality Data adapted from Lisella and Johnson (18).

These findings indicate that serious injuries and illnesses in camps are much less than the national averages. Results show .1026 serious injuries per 1000 camper days and .08 to .29 serious illnesses per 100 camper days. The American Camping Association (33) compared these figures to national statistics which resulted in the following figures:

(1) The National Safety Council reports that 1 in 62 people (of camp age) was disabled one or more days by injuries received in home accidents in 1978.

(2) A similar figure to this for camps is 1 in 10,000.

(3) Accidental drownings for children 5-15 is 1 in 36,000.

(4) Reported drownings in camps are 1 in 1,000,000 (33).

The sixth study was conducted by the Center for Disease Control from 1976 through 1979 on deaths occurring among resident youth campers. The results showed 53 deaths, 65.1% of which were male and 24.5% female from ages 6 through 19. The most significant cause was drowning which accounted for more than 60% of all deaths. Other causes included falls from bunks, vehicle accidents, and others (18). Lisella and Johnson (19) conclude that the high percentage of drownings indicate a need for closer supervision in general because some of the campers who drowned were swimming in unauthorized situations.

These six studies provide strictly frequency information which, by itself, produces no expression on relative degrees of risk. This information cannot be used to judge the safety of a camp or program adequacy, but rather

to aid Congress in deciding the need for federal legislation concerning youth camp safety and health (33).

The findings of these studies do not have direct significance on this project due to the nature of the data collected. They have been included because they represent the only statisical studies found that evaluate camp injuries and illnesses. These six studies are therefore significant because they demonstrate concern for safety and health at resident camps on a federal level; they also demonstrate a lack of variability, and quantity of research in this area.

A seventh study of a different nature was conducted by Jeanne Otto, R.N. (24) in 1980. Otto surveyed all American Camping Association accredited residential camps in the New England area to find the ten most prevalent illnesses at these camps. Otto (24) found that the type of complaint and rank order was very consistent from camp to camp and with her own experiences. Observations from the 105 respondents are ranked below:

(1) sore throat (53)
(2) cuts/lacerations (45)
(3) scrapes/bruises (45)
(4) turned ankles/sprains (37)
(5) headache (33)
(6) stomach ache/upset (32)
(7) colds/stuffy nose (29)
(8) otitus media (middle ear infection) (28)
(9) poison ivy (26)
(10) otitus externa (swimmer's ear) (18).

(24).

Otto (24) concluded that minor accidents are much more prevalent than major accidents. She felt that " ... this suggested that basic ground rules for accident prevention are effectively minimizing major injuries, but that perhaps further measures are required to reduce the number of minor injuries" (24).

Otto (24) proposes a list of measures to reduce minor injuries and illnesses at camp which is summarized below:

(1) Health and safety training of staff should be required in pre-camp period to make the staff more diligent in areas and activities with high accident rates.

(2) Campers should be taught safety measures, and adequately supervised.

(3) Stress periods (prior to mealtime, competition) and at times of increased fatigue should be more closely supervised.

(4) Illnesses can be reduced by increased staff awareness concerning:
- prevention of fatigue
- proper clothing and hygiene
- early recognition of symptoms, and
- camper satisfaction (24).

Otto (24) believes these steps would help reduce minor physical complaints which potentially reduce the quality of a camper's experience.

Otto (24) also discusses environmental health problems apart from injuries and illnesses. These were found to come from several areas:

(1) Site characteristics (i.e., swampy breeding grounds for mosquitoes).

(2) Food area cleanliness (i.e., mild food poisoning).

(3) Natural hazards (i.e., sunburn, barefoot injuries, bee stings and bites, and poison ivy) (24).

She believed these factors may present potential problems if there is a failure to respond appropriately to the setting or if general health and safety principals are ignored.

Otto's study (24), while of a broad nature, provides a basis for the design of a method for describing and explaining the safety and health aspects of a resident camp. A survey of resident camp injuries and illnesses could be of benefit by highlighting problem areas for injuries, illnesses, and environmental hazards. Once these problem areas are analyzed on a camp by camp basis, safety and health training for staff, monitoring of troublesome areas, and elimination of potential safety and health hazards can be implemented. Without such an evaluation, identification of problem areas such as those mentioned in Otto's study (24) rely on non-standarized techniques which may operate on a hit-or-miss basis.

These seven studies indicate a growing interest in the analysis of injuries and illnesses occurring at resident camps. Both the federal government and the American Camping Association have supported these studies only in recent years (33). The results found in these studies are of a broad nature, and useful mainly for statistical comparisons. Further research of an evaluative nature will be necessary before the health and safety aspects of any particular program can be evaluated.

Safety and Health in Resident Outdoor Education

Five areas deliniate safety and health criteria for resident outdoor education programs. First, there is a discussion of the standards and regulations which affect the resident outdoor education centers. These differ broadly from state to state, and are mostly tentative as far as safety and health regulations are concerned. Both suggested regulations and established standards are discussed. Other specific regulations will be mentioned in the following sections as they relate to each topic. Second, aspects of safety and health that are of concern to camp administrators are discussed along with a description of administrative safety and health guidelines as proposed by the American Camping Association. The third area covers the safety and health aspects of program planning, both as suggested by the American Camping Association, and by other sources. Next, and closely related to program planning, are suggested safety and health criteria for site planning. This area covers site design, characteristics, and building plans as they pertain to safety and health. The final section discusses suggested evaluation procedures that pertain to maintaining safety and health objectives and guidelines established by the administration, program plans, and site design.

Established Standards and Regulations

There are no federal safety and health regulations that affect resident outdoor education participants. The regulation of resident outdoor education programs has been left up to the state and local governments (33, 13). All states have some regulations that affect camps, many of which are very minimal. Most states have health and sanitation laws to some degree, and fewer states have laws concerning safety and health aspects of camps (33). There are

seventeen states that have rather comprehensive safety and health laws for resident camps as listed below:

California	Kentucky	Mississippi	Rhode Island
Colorado	Maine	New Hampshire	Tennessee
Connecticut	Massachusetts	New Jersey	Texas
Illinois	Michigan	New York	Vermont
			Wisconsin (33)

"Comprehensive" can be defined here as having regulations in the following areas: sanitation and food, transportation, personnel, program safety, site and facilities, personal health, and first aid and medical services (33).

In the state of Ohio resident camps are subject only to local county or city code standards for sanitation, fire safety, and general health related standards. There are no state regulations regarding the comprehensive safety and health (13).

In 1970, Stagher (12) reviewed state laws that directly affected outdoor education programs and identified only 91 such laws. He found that 15 states had no laws pertaining to outdoor education and that 57% of the existing laws were limited to seven states. Stagher concludes that there is a definite need for more legislation pertaining to resident outdoor education because some states without such laws have resident outdoor education programs. This information indicates a lack of any standardization in state laws governing resident outdoor education programs. There is, however, a publication that has been prepared to assist state regulatory agencies in the development of comprehensive youth camp safety programs. The Youth Camp Safety and Health: Suggested State Statute and Regulations is published by the U. S. Department

of Health, Education, and Welfare for this purpose (36). This publication includes a brief statute for state legislation, and outlines minimum standards that should apply to different types of camps, including resident outdoor education. The American Camping Association also accredits approximately 2,000 camps in the United States, of which half operate in the fall, winter, and spring, and may be used for resident outdoor education (33). These accredited camps are then subject to the Association's safety and health standards which are well defined and updated periodically.

Safety and health standards established by the American Camping Association are similar to those suggested by the U.S. Department of Health, Education and Welfare. These standards will be discussed in more detail in the following sections on administration, site planning, and program planning. It should be noted that in most states, including Ohio, these comprehensive safety and health standards are optional, and may or may not be followed in varying degrees by different resident outdoor education programs.

Administrative Standards

Four studies dealing with administrative policies and concerns for resident outdoor education were found which specifically listed safety and health as a major duty of the camp administration (11, 12, 28). Many resident outdoor education curriculum guides have specific, written procedures for dealing with safety and health aspects in their programs (3, 5, 7, 22, 27). These written procedures deal with aspects such as health forms, health clinics or infirmaries, safety and health, emergency procedures, instruction, health personnel staffing, health aspects of site selection and program planning, record keeping, and liabilities. These studies and curriculum

guides demonstrate that camp administrators are concerned with safety and health, and are following suggested standards to a large degree.

Administrative standards which relate to safety and health, as proposed by the American Camping Association (35) and the U. S. Department of Health, Education, and Welfare (36), are briefly summarized below:

(1) Insurance

a. The camp should have comprehensive liability insurance.

b. Each camper should be covered by health and accident insurance.

(2) Records

a. Each camper should have a health history form listing special medical conditions.

b. A complete record of all accidents, first aid rendered, and medical treatment of everyone in camp should be recorded in ink and kept for at least three years.

(3) Facilities and Staffing

a. Each camp should have a first aid facility or area with first aid supplies available to staff.

b. Each camp should have someone adequately trained to render first aid with a minimum of Red Cross Standard First Aid.

(4) Emergencies

a. Each camp should have written emergency procedures and transportation.

(5) Sanitation and Fire

a. Local or state sanitation and fire codes should be followed.

(35, 36).

This listing is not a comprehensive guide for administrative safety and health regulations, but rather it is provided as an overview of the guidelines that may be followed by resident camps. These suggested standards provide a basis for dealing with safety and health problems once they have occurred. The old saying that an "ounce of prevention is worth a pound of cure" is very applicable here. If safety and health are considered in program planning, site planning, and evaluation procedures, many injuries and health problems might well be eliminated.

Program Planning

Program planning for resident outdoor education involves many aspects such as educational objectives, site availability, and financing (6). The Texas Educational Institute's guide for outdoor education site planning and program implementation (25) includes a model for program planning. Some of the proposed program specifications include:

(1) That the program design should include learner activities designed to address objectives.

(2) Activities should utilize local and regional resources, and be screened for relevancy and practical application (25).

Safety and health are among the objectives of many resident outdoor education programs (3, 5, 7, 22, 25, 27), and are therefore important considerations in program planning. The second aspect in the Institute's

guide (25) indicates underlying safety and health considerations when site relevancy is considered in the planning process. Program standards recommended by the American Camping Association (36) and U. S. Department of Health, Education, and Welfare (36) are summarized below:

(1) General Safety

a. All equipment and facilities should be in good repair and good condition.

b. Equipment should be given a safety check prior to use.

(2) Activities

a. The camp should have written operating procedures and regulations for all activities.

b. The activity leader should be competent in skills, teaching, be familiar with natural environmental hazards, and use of the equipment.

(3) First Aid

a. First aid supplies should be available to meet potential emergencies.

(35, 36).

These general safety procedures for programs emphasize prevention through use of proper and safe equipment that is controlled by a knowledgeable staff member. Injury and illness evaluation could benefit program planners by highlighting troublesome areas that may need more attention in the areas of safety equipment or adequate staffing.

Site Planning

Safety and health were considerations in five studies dealing with site planning for resident outdoor education programs (6, 12, 25, 27, 31). Site planning involves several elements such as physical components, ecology of the site, minimum spacing, and building design and placement (6).

Donaldson (6) emphasizes in his planning guide for resident outdoor education that "too much care cannot be exercised at this point in site selection; health and safety for children is an absolute must" (6). Donaldson (6) further lists considerations for site planning and selection including:

(1) Program requirements,

(2) Health aspects,

(3) Safety aspects (topography, man made detriments), and

(4) Good access roads.

(6)

The American Camping Association (35) and the Department of Health, Education, and Welfare (36) list site guidelines as summarized below:

(1) Location

a. Camp should be accessible at all times during the camping season.

(2) Buildings

a. Building should comply with zoning codes, be kept in good repair, and be maintained in a safe, sanitary condition.

(3) Inspection

a. Leader or sponsoring person should inspect site prior to use and assess hazards and suitability.

b. There is a written plan regarding risks to humans from both natural and man-made site hazards that is implemented through the following:

- identification of risks
- establishment of regulations
- provision of protective devices
- elimination of hazards where feasible.

(35, 36).

Site selection is a safety oriented process. Program development and site planning will be highly interrelated if the two are developed to fit each other (25). Injury and illness evaluation could become an important part of site planning by indicating what activities may be hazardous, and pinpointing areas where problems tend to occur. This type of evaluation could be especially beneficial in determining where hazards are located, and whether the site is applicable to the type of program offered from a safety and health standpoint.

Evaluation

Evaluation of injuries and illnesses occuring in a resident outdoor education program could assist camp and school administrators in meeting both objectives and proposed safety and health guidelines. Roth (1976) summarizes two studies on administrative practices by stating the four following criteria on evaluation:

" (1) Better needs surveys must be attempted.

(2) Services must be restructured to meet the identified needs.

(3) Improved evaluation is needed.

(4) Key administrators and top level managers must be more immediately involved in the development and evaluation of environmental education programs" (29).

There are no guidelines for evaluation procedures listed by either the American Camping Association or the U.S. Department of Health, Education, and Welfare in their publications on standards. Although there are evaluation manuals for environmental education administrators, they are concerned with cognitive and affective aspects of the program (20), but no mention is made of any criteria for determining the safety and health of participants.

Evaluation procedures are varied in method and optional to each environmental education administrator. If an evaluation procedure is to be implemented, it should include not only cognitive and affective research methods, but also research that can evaluate all program objectives. Injury and illness evaluation could be an effective way to evaluate resident outdoor education administrative procedures, programs, and sites to determine if safety and health objectives are being met in each of these areas.

Summary

Resident outdoor education programs have been implemented in the United States since the late 1920's, and have experienced a rapid increase in the last ten years. Throughout the development of resident outdoor education, safety and health have been among the objectives listed for many programs; however, little has been done to insure that this objective is being accomplished. Since 1966 there has been a Congressional interest in youth camp

safety, which has resulted in six studies that dealt with serious injuries and illnesses occurring in resident camps which have attempted to determine the need for youth camp safety legislation. A seventh study dealt with general injuries and illnesses that occur in resident camps, and suggested guidelines for preventing those of a less serious nature. The results of these studies were general, and provided statistical information useful in comparisons, but no measures for evaluating the safety of any program. Although injury and illness studies are few in number, they demonstrate a concern for resident camp safety and health, and suggest a need for further evaluative research in this area.

Resident camp safety and health standards, which are established at state and local government levels, are limited, and vary greatly from state to state. The majority of states have only minimal sanitation and building codes which affect resident outdoor education centers, and a need has been demonstrated for more comprehensive state safety and health laws for resident camping programs. Suggested safety and health standards for resident camps have been published by the American Camping Association and the U. S. Department of Health, Education and Welfare which are followed in varying degree by many resident camping programs. Standards and objectives for administration, program, and site planning, and evaluation of resident outdoor education programs all indicate a need for injury and illness evaluation so that program objectives and suggested standards may be better accomplished.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

The success of a resident outdoor education program can be determined by the achievement of the program's goals and objectives. Safety and health is one objective listed for many resident outdoor education programs which has had little evaluation. This study is designed to describe and explain injuries and illnesses through the assessment of injury and illness records of an upper-elementary resident outdoor education program.

A review of related literature shows that research on injuries and illnesses in resident camping programs has been of a limited nature, and focused on gathering statistical data useful mainly for determining a need for federal youth camp safety legislation. These studies demonstrate a concern not only for resident camp safety and health, but also a need for further research to evaluate the safety and health aspects of resident outdoor education programs. This study assesses injuries and illnesses in one resident outdoor education center. The results will be described and explained using frequencies and mode to indicate trends in injuries and illnesses. Results will be used to both evaluate the safety and health aspects of the resident outdoor education program and add meaning to what is currently known about injuries and illnesses.

This chapter details the research design and metholology utilized. Four major categories are discussed: research objectives, design considerations, data collection, and data analysis.

Research Objectives

The following objectives guided this study:

(1) To assess and investigate relationships in the injury and illness records of upper elementary students attending Camp Joy's resident outdoor education program in the fall, winter, and spring.

(2) To describe and explain injuries by season in terms of location, event causing the injury, and type of injury.

(3) To describe and explain injuries by nature of the activity in terms of location, event causing the injury, and type of injury.

(4) To describe and explain illness by season, in terms of frequency, and diagnosis of the illness.

Design Considerations

The intent of this study is to gather and explain information on injuries and illnesses occurring in participants in Camp Joy's resident outdoor education program. The research design employed is a numerical data summation, designed to describe and explain the data using measures of centrality. A sample of twelve week-long sessions of upper-elementary Cincinnati public school groups participating in Camp Joy's resident outdoor education program during the 1979-1980 school year is the study population.

To accurately obtain the needed frequency data for injuries and illnesses, an information sheet on injuries and illnesses was adapted from Youth Camp Safety and Health published by the U.S. Department of Health, Education, and

Welfare (36). This information sheet provides categories for tallying frequencies of injuries and illnesses for those cases which meet the predetermined criteria that are described in the next paragraph. Injuries are ranked in terms of season, location, event, nature of activity, and type of injury. Illnesses are ranked in terms of season and diagnosis. The information is gathered from the camp's Nurse's Log, and Supervisor's Journal, which are written records of daily activities recorded to the specifications of the American Camping Association (35).

In order to limit the data to significant injuries and illnesses occurring among the sample population limitations were set on the data collected. For the purposes of this study, the following limitations will be observed:

(1) No injuries or illnesses sustained or contracted before attending the resident outdoor education program will be recorded.

(2) Only students with injuries or illnesses that were attended by a registered nurse or medical doctor will be recorded. Injuries and illnesses will be recorded if attended by supervisory staff, and later reviewed by a registered nurse.

(3) No injuries or illnesses will be recorded if no treatment was given, or some action taken such as placing a bandage on an injury or removing the child from camp.

(4) No dispensing of prescription medicine done by the nurse or doctor will be recorded.

(5) Illnesses of arbitrary nature such as headaches, sore throats,

colds, or stomachaches will not be recorded unless accompanied by symptoms of illness such as fever or vomiting.

(6) Any allergic reaction or allergy related illness will be recorded. This includes illnesses such as asthma, poison ivy, and hives.

(7) Any insect or spider bite which could potentially illicit an allergic response will be recorded. This includes bee stings and spider bites. Due to their non-serious nature mosquito and chigger bites will not be recorded.

These limitations have been selected to include injuries or illnesses which are genuine, and either serious or potentially serious in nature. "Potentially serious" injury or illness can be defined in the context of this paper to be any injury or illness which could worsen in severity, such as becoming infected, illiciting an allergic response, or by worsening at some time. These potentially serious injuries and illnesses are considered significant because of either their real or potential severity. The limitations have been selected to exclude any injuries or illnesses which are not potentially severe in nature.

Data Collection

Data Set

This study employs a single data set from Camp Joy in Cincinnati, Ohio. This data set consists of cases collected through the sampling of records of twelve week-long sessions of upper-elementary Cincinnati public school groups participating in Camp Joy's resident outdoor education program in the 1979-1980

school year. Observations were gathered and recorded for all injuries and illnesses which met the prescribed limitations defined in the previous section.

The observations were recorded from a Nurse's Log kept by Camp Joy's registered nurse and other supervisory staff, and from the Supervisor's Journal kept by different supervisors for each school group. The Nurse's Log is kept according to regulations specified by the American Camping Association (36), and consists of a bound, lined, and dated book with entries in ink of all the first aid rendered and prescriptions dispensed. The Supervisor's Journal is a book of the same nature with dated, daily records in ink of the day's activities, and details on unusual occurrences, such as staff problems, fights, injuries, illnesses, and emergencies.

Data Collection Sheet

The data collection sheet is adapted from the sample "Camper Injury and Illness Report" suggested by the U. S. Department of Health, Education, and Welfare (36). This sample form is designed for resident camping programs, and is adapted for resident outdoor education programs by modifying sections on locations and activities at the time injuries occurred. The data collection sheet is shown in Appendix A.

Data gathering was accomplished using this data collection sheet to record injuries and illnesses listed in the Nurse's Log and the Supervisor's Journal. The data was collected during January and February of 1981 during two visits to Camp Joy's administrative office in Cincinnati, Ohio. The injuries and illnesses were recorded according to the limitations listed in the previous section.

Data Analysis

This section summarizes the statistical techniques utilized to describe and explain the data set. The data produced through the data collection is statistically manipulated by the Statistical Package for the Social Sciences (SPSS) (30). The major statistical techniques used in analyzing the data are modal tendencies and frequency measures which are calculated for the overall data set description. Contingency tables are constructed to show interrelationships among the data.

Summary

The research design for this study is numerical data summation which involves collecting frequency data about injuries and illnesses in an Ohio resident outdoor education program, and explaining the data based on modal tendencies and frequency measures.

The data set is gathered using data collection sheets to code information from the Nurse's Log and Supervisor's Journal of Camp Joy's resident outdoor education program (16). The data set is limited by pre-determined limitations in order to include injuries and illnesses that are potentially serious in nature. Information from the data set includes injury frequencies in terms of location, event, activity, and nature of injury, and illness frequencies in terms of diagnosis.

Results from the data collection are summarized and tabulated by SPSS (30). Data is analyzed using modal tendencies and frequency measures. The analyses are based on these statistics.

CHAPTER IV

RESULTS

Data Analyses are reported in this chapter in two sections. First, the data is described in terms of injury and illness frequencies. Second, the data set is described in terms of injury by season and supervised/unsupervised activity, and in terms of illness by season and nature of illness.

Description of the Data Set

The data set consisted of data collected on injuries and illnesses that occurred among 1,271 participants in a resident outdoor education program. Table 1 shows the distribution of the data set by gender and season.

Table 1

Population Frequency

Gender/Season	Fall	Winter	Spring	Total	Percent
Male	180	242	260	682	53.7
Female	127	225	237	589	46.3
Total	307	467	497	1271	100
Percent	24.2	36.7	39.1	100	

The percentages shown in Table 1 will be utilized in the following sections to compare frequencies by gender, and season of participation.

Injury and Illness Frequencies

This section reports and discusses the frequencies of injuries and illnesses in two parts. Each section is begun with a description, and a frequency table which is followed by a discussion of each variable represented in the tables.

Injury Frequencies

In the study population of 1,271 participants, data on 71 injuries was collected. Each injury was described in terms of gender of participant, location at the time of the injury, event causing the injury, activity at the time of the injury in terms of supervised/unsupervised activity, and the nature of the injury. Table 2 lists the variables observed, observation categories, frequencies, and percentages for the injuries observed in the sample set.

Table 2

Description of Injuries (n=71)

		N	Percent
Gender	Male	41	57.7
	Female	30	42.3
Location of Injury	Living Quarters	12	16.9
	Dining Area	4	5.6
	Shower/Toilet	0	0
	Other Building	0	0
	Arts/Crafts Area	4	5.6
	Nature Area	1	1.4
	Trail	9	12.7
	Sport or Rec. Field/Court	7	9.9
	Campfire/Cookout Area	2	2.8
	Road/Highway	8	11.3
	General Campgrounds	16	22.5
	Transportation Vehicle	0	0
	Other	2	2.8
	Unknown	6	8.5
Type of Event Causing the Injury	Falling/Stumbling	23	32.4
	Collision with Person or Object	4	5.6
	Struck by Person	3	4.2
	Struck by Missile	4	5.6
	Bite or Sting - Insect or Spider	14	19.7
	Bite or Wound from Animal	1	1.4
	Contact with Heat	0	0
	Using a Tool	5	7.0
	Contact with Sharp Object (not tool)	9	12.7
	Other	5	7.0
	Unknown	3	4.2

Table 2 (continued)

		N	Percent
Activities at the Time of the Incident Causing Injury	Supervised	30	42.3
	Unsupervised	41	57.7
Supervised Activities	Trail Group	2	2.8
	Arts and Crafts	4	5.6
	Transportation	0	0
	Hiking/Climbing	7	9.9
	Games/Sports	7	9.9
	Daily Routine	9	12.7
	Other/Unknown	1	1.4
Unsupervised Activities	Fighting	1	1.4
	Horseplay	5	7.0
	Walking/Running	22	31.0
	Daily Routine	5	7.0
	Other/Unknown	8	11.3

Nature of Injury	Head/ Neck	Eye	Upper Limb	Lower Limb	Torso	Other/ Unknown	Total	Percent
Bruise	9	0	0	3	1	0	13	17.8
Burn	1	0	0	2	0	0	3	4.1
Fracture	1	0	0	0	0	0	1	1.4
Cut/Puncture	3	0	24	4	4	0	35	47.9
Sprain/ Dislocation	0	0	4	1	0	0	5	6.9
Other/ Unknown	8	1	4	3	0	0	16	21.9
Total	22	1	32	13	5	0	73	100
Percent	30.1	1.4	43.8	17.8	6.9	0	100	

The "gender variable" reveals that 57.7 percent of the injuries occur in males and 42.3 percent in females. The data set is composed of 53.7 percent males and 46.3 percent females. Therefore, there are more male participants injured than female relative to total sample set frequencies.

The "location of injury" variable reveals that the general campgrounds is the most frequent place for an injury to occur with 22.5 percent of all injuries. Living quarters account for the second highest frequency, and 16.9 percent of all injuries. Four areas accounting for approximently 10 percent of the injuries each, in order from highest to lowest are the trail, the road or highway, sport or recreational fields and courts, and unknown locations. The remaining ten locations are approximently 5 percent of below.

The "type of event causing injury" variable reveals that both falling/ stumbling at 32.4 percent, and insect stings/spider bites at 19.7 percent are the most frequent events causing injuries. Contact with sharp objects other than tools, use of tools, and other events rank 12 percent, 7 percent, and 7 percent respectively with the remaining six events accounting for approximately 5 percent or less of the injuries.

The activities at the time of "incident causing injury" variable reveals that unsupervised activities had 57.7 percent of the injuries while supervised activities had 42.3 percent. Four supervised activities were prevalent, listed in decreasing order: daily routine; games and sports; hiking and climbing; and arts and crafts were the most frequent supervised activities when injuries occurred. Of the unsupervised activities, walking and running accounted for over 30 percent of all injuries, with other or unknown causes, daily routine, and horseplay accounting for over 10 percent each. Only one unsupervised activity, fighting, accounted for less than 5 percent of all the injuries occurring among the sample set.

The "nature of injury" variable reveals both the type of injury and the body part injured. Cuts/punctures accounted for almost 50 percent of the injuries, with other or unknown causes second accounting for 21.9 percent. Bruises accounted for 17.8 percent, and burns, sprains/dislocations, and fractures were much lower at around 5 percent. The most frequent body part injured was the upper limb which showed 43.8 percent of all injuries, followed by head and neck injuries at 30.1 percent. The lower limb also accounted for many injuries at 17.8 percent. The most frequent types of injuries to one body part were cuts/punctures to the upper limb comprising 33.8 percent of all injuries occurring in the sample set.

Illness Frequencies

There were 58 illnesses occurring in the sample set of 1,271 participants. Each illness is described in terms of gender of the participant, and diagnosis of the illness. Table 3 lists the variables observed, description categories, frequencies, and percentages.

Table 3

Description of Illnesses (n=58)

		N	Percent
Gender	Male	21	36.2
	Female	37	63.8
Infectious or Inflammatory Disease	Yes	2	3.4
	No	56	96.6
	Respiratory Infection	0	0
	Gastroenteritis	0	0
	Dental	0	0
	Earache or Ear Infection	2	3.4
	Appendicitis	0	0
	Miscellaneous/Other	0	0
	Not Applicable	56	96.6
Allergic Disease	Yes	33	57
	No	25	43

Table 3 (continued)

		N	Percent
	Asthma	7	12.1
	Pollen/Allergy	3	5.2
	Food	0	0
	Poison Ivy	13	22.4
	Hives/Rash	9	15.5
	Other	1	1.7
	Not Applicable	25	43.1
Toxic Disease	Yes	2	3.4
	No	56	96.6
	Insect Bites	1	1.7
	Poison Ivy	1	1.7
	Drug Uses	0	0
	Not Applicable	56	96.6
Other Conditions	Homesickness	6	10.3
	Undiagnosed Conditions/ Fever, etc.	15	25.9
	Miscellaneous disorders/ Nose Bleeds, etc.	0	0
	Not Applicable	37	63.8

The "gender" variable reveals that 63.8 percent of the illnesses were in females and 36.2 percent in males. The total sample set has 53.7 percent males and 46.3 percent females indicating a much higher illness rate in females over males.

The "infectious disease" variable and the "toxic disease" variable had only two responses each. There were two infectious earaches, and no other infectious diseases so this variable accounts for 3.4 percent of all illnesses. The two toxic diseases were one bee sting, and one case of blood poisoning which both accounted for a total 3.4 percent of all illness in the sample set. Because of the low frequencies illustrated by these two variables they will not be considered in the cross tabulations.

The "allergic disease" variable accounted for 57 percent of all of the illnesses in the sample set. The most prevalent allergy was poison ivy at 22.4 percent, followed by hives/rash, and asthma at 15.7 percent and 12.1 percent respectively. Pollen, foods, and other causes accounted for 5 percent or less of all allergy related illnesses.

Other conditions causing illness accounted for 36.2 percent of all illnesses in the sample set. Undiagnosed conditions were the most common at 25.9 percent, followed by homesickness at 10.3 percent. There were no illnesses characterized by miscellaneous disorders.

Overall, allergy-related illness was the most prevalent variable accounting for 57 percent of all illnesses, but the highest single cause observed was undiagnosed conditions which accounted for 36.2 percent of all illness in the sample set.

Injury and Illness Crosstabulations

This section reports and discusses injuries and illnesses in three parts. Parts one and two describe injuries by both season and by supervised/unsupervised activities in terms of location, and the event at the time the injury occurred. Part three describes illnesses by season in terms of frequency and diagnosis. Each section contains crosstabulations for each comparison which are followed by descriptions of the data.

Injuries by Season

This section described injuries by the season variable in terms of the variables "location of the injury" and "event causing the injury." Each comparison is begun with a contingency table and followed by a description of the data.

Table 4

Catagorization of Injuries by Season
by type of Location of the Injury (n=71)

Description Category	Fall	Winter	Spring	Total	Percent
Living Quarters	3	6	3	12	16.9
Dining Area	1	0	3	4	5.6
Shower/Toilet	0	0	0	0	0
Other Building	0	0	0	0	0
Arts and Crafts	0	3	1	4	5.6
Nature Area	0	0	1	1	1.4
Trail	2	1	6	9	12.7
Sport/Rec. Area	2	2	3	7	9.9
Campfire/Cookout	2	0	0	2	2.8
Road/Highway	1	3	4	8	11.3
General Campgrounds	9	3	4	16	22.5
Transport Vehicle	0	0	0	0	0
Other	0	1	1	2	2.8
Unknown	1	0	5	6	8.5
Total	21	19	31	71	100
Percent	29.6	26.8	43.7	100	

Table 4 reveals that in the fall general campgrounds had the highest injury rate, in the winter the living quarters had the highest injury rate, and in the spring the trail had the highest injury rate. Overall, more injuries occurred in the fall than in winter or spring. This is illustrated by the fact that

29.6 percent of the total injuries occur in fall when only 20.7 percent of the participants were in attendance. Both winter and spring have lower percentages. Winter shows 26.8 percent of all injuries when 29.3 percent of the participants were in attendance. Spring shows a still lower injury rate having 43.7 percent of all injuries when 50 percent of the participants were in attendance. Overall, the general campgrounds and the sleeping quarters have a high injury rate every season that is relatively consistent. The same is true, on a smaller scale, for the sports/recreation areas, and the road/highway area.

Table 5

Catagorization of Injuries by Season by Type of the Event Causing the Injury (n=71)

Description Category	Fall	Winter	Spring	Total	Percent
Falling/Stumbling	6	7	10	23	32.4
Collision with Object	0	3	1	4	5.6
Struck by Person	2	1	0	3	4.2
Struck by Missile	1	0	3	4	5.6
Sting/Insect	5	0	9	14	19.7
Bite/Animal	0	0	1	1	1.4
Contact with Heat	0	0	0	0	0
Using a Tool	1	3	1	5	7.0
Contact with Sharp Object	2	3	4	9	12.7
Other	2	2	1	5	7.0
Unknown	2	0	1	3	4.2
Total	21	19	31	71	100
Percent	29.6	26.8	43.7	100	

Table 5 reveals that both falling/stumbling and insect stings are the highest causes of injuries in the fall, that falling/stumbling is by far the highest cause of injury in the winter, and that falling/stumbling and insect stings are the highest causes of injury in the spring. It should also be noted that there were no injuries caused by insect stings in the winter.

In general, the table revealed that there were no seasonal trends for animal bites, contact with sharp objects, or other causes. In general, seasonal trends did indicate that there are more collisions in the winter, more fights in the fall, and more tool-related injuries in the winter.

Injuries by Supervised/Unsupervised Activities

This section describes injuries by supervised/unsupervised activity in terms of "location of injury" and the "event causing the injury" variables. Each comparison is begun with a contingency table, and concluded with a description of the data.

Table 6

Catagorization of Injuries by Supervised/ Unsupervised Activity by type of Location of Injury (n=71)

Description Category	Supervised	Unsupervised	Total	Percent
Living Quarters	6	6	12	16.9
Dining Area	1	3	4	5.6
Shower/Toilet	0	0	0	0
Other Building	0	0	0	0
Arts and Crafts	4	0	4	5.6
Nature Area	1	0	1	1.4
Trail	8	1	9	12.7
Sport/Rec. Area	6	1	7	9.9
Campfire/Cookout	2	0	2	2.8
Road/Highway	0	8	8	11.3
General Campgrounds	1	15	16	22.5
Transport Vehicle	0	0	0	0
Other	1	1	2	2.8
Unknown	0	6	6	8.5
Total	30	41	71	100
Percent	42.3	57.7	100	

Table 6 shows that injuries which occurred during supervised activities were most frequent on the trail, and also frequent in sports/recreational areas, and sleeping quarters. Injuries that occurred during unsupervised activities were most frequent on the general campgrounds. They were also frequent on the road or highway, in the sleeping quarters, or at unknown locations. Overall, injuries which occurred in unsupervised activities are more concentrated in fewer categories, and injuries which occurred in supervised activities are spread out over more categories and fewer in number.

Table 7

Catagorization of Injuries by Supervised/ Unsupervised Activity by Type of Event Causing the Injury (n=71)

Description Category	Supervised	Unsupervised	Total	Percent
Falling/Stumbling	7	16	23	32.4
Collision with Object	0	4	4	5.6
Struck by Person	1	2	3	4.2
Struck by Missile	1	3	4	5.6
Sting/Insect	5	9	14	19.7
Bite/Animal	1	0	1	1.4
Contact with Heat	0	0	0	0
Using Tool	5	0	5	7.0
Contact with Sharp Object	6	3	9	12.7
Other	4	1	5	7.0
Unknown	0	3	3	4.2
Total	30	41	71	100
Percent	42.3	57.7	100	

Table 7 reveals that during supervised activities there were five events which most frequently caused injuries. Listed in decreasing order these events were falling/stumbling, contact with a sharp object; insect sting; using a tool; and other causes. Table 7 also shows that the majority of injuries that occurred during unsupervised activities were due to falling/stumbling. Stings from insects occurred about half as frequently as falling and stumbling in unsupervised activities.

Illnesses by Season

This section describes illnesses by season in terms of the "allergic disease" variable, and the "other conditions" variable. The other two classifications for diagnosis, the "toxic disease" variable and the "infectious/inflammatory disease" variable, are not described by season due to the small amounts of data in each category. The description of each variable is begun with a contingency table, and concluded with a description of the data.

Table 8

Catagorization of Illnesses by Season by Type of Allergic Disease (n=33)

Description Category	Asthma	Pollen/ Allergy	Food	Poison Ivy	Hives/ Rash	Other	Total	Percent
Fall	3	1	0	1	2	2	8	24.2
Winter	2	0	0	0	7	0	9	27.3
Spring	2	2	0	11	0	1	16	48.5
Total	7	3	0	13	9	1	33	100
Percent	21.2	9.1	0	39.4	27.3	3.0	100	

Table 8 revealed that allergic diseases in the fall were most likely to be asthma, that allergic diseases in the winter were most likely to be hives/rash, and that allergic diseases in the spring were most likely to be poison ivy. In comparing allergic diseases to the total sample set, the percentage of allergic diseases occurring in the fall is exactly the same as the percent of participants attending in the fall at 24.2 percent. In the winter, the percent of allergic diseases is 27.3 percent which is lower than the percentage of participants at 36.7 percent. The spring shows a large increase in the

number of allergic diseases with 48.5 percent, while only 39.1 percent of the participants attend in the spring (see Table 1).

Table 9

Categorization of Illnesses by Season by Type of Other Conditions (n=21)

Description Category	Homesickness	Undiagnosed Conditions	Miscellaneous	Total	Percent
Fall	1	2	0	3	14.3
Winter	2	5	0	7	33.3
Spring	3	8	0	11	52.4
Total	6	15	0	21	100
Percent	28.6	71.4	0	100	

Table 9 reveals that undiagnosed conditions are the most frequent types of "other condition" that occurred in the fall, winter and spring. Illness in terms of "other conditions" was lowest in the fall with 14.3 percent of the total cases occurring when 24.2 percent of the participants attended. In the winter, the incidence of "other conditions" was 33.3 percent of the total which is similar to the 36.7 percent of the participants who attended in winter. As in Table 9, the spring shows an increase in occurrence of "other conditions" with 52.4 percent of the "other conditions" diagnosed when only 39.1 percent of the participants were in attendance.

Summary

The results of the data analysis were presented in this chapter. In the first section the data set was described in terms of injury and illness frequencies. Injuries are described using modal tendancies and frequencies in terms of gender, location of injury, event causing the injury, and activity

at the time of the injury. Next, illnesses are described using modal tendancies and frequencies in terms of gender, and diagnosis of the illness.

The second section described the data in terms of injury by season and supervised/unsupervised activity, and in terms of illness by season and diagnosis of the illness. Crosstabulations were used to catagorize the data which is described using modal tendancies and frequencies.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

This chapter offers a discussion of the results of this study, and conclusions as they relate to a resident outdoor education program. The results are discussed in two sections, one concerning injuries, and the other concerning illnesses. Contributions of this study, and recommendations for further research are then presented.

Discussion

This section discusses the interpretations and evaluations of the data in two sections. The first section discusses injuries in terms of overall frequencies, in relation to season, and in relation to supervised/unsupervised activities. The second section discusses illnesses in terms of overall frequencies, and season.

Injuries

The overall frequencies for injuries shown in Table 2 reveal several factors which indicate areas in which the higher rates of injuries have occurred. There was a disproportionately high percentage of injuries occurring in males as compared to females. This indicates that males are more prone to injury in Camp Joy's resident outdoor education program. This observation may indicate that it is more common for males to engage in rougher, more adventuresome activities which may account for a high number of the injuries which occurred.

There were six locations at the outdoor education center which had ten percent or more of the injuries occurring in each location. The general campground area was the most frequent location, closely followed by living/sleeping quarters. Both of these areas may be places where the participants spend much of their time. Participants may be on the general campgrounds for many activities including free periods, moving to and from activities or meals, and also during some activities. The living/sleeping quarters also account for a high percentage of the participants' time including sleeping, meal preparation, and morning or evening preparation. Considering that participants may spend much of their time in both the general campgrounds and in the living/sleeping quarters a higher percentage of the injuries which occur there might be expected. Four other locations each accounted for approximently ten percent of the injuries as follows: the trail, the road or highway, sport or recreational fields and courts, and unknown locations. Together, all six locations account for approximently 80 percent of all injuries and therefore merit attention to see if injuries occurring in each area could be reduced.

Five of the eleven events causing injuries surveyed accounted for 7 percent or more of the total injuries. Falling/stumbling at 32.4 percent and insect stings at 19.7 percent were the two highest. Falling and stumbling of participants could be lessened in several ways. One, obstacles which cause falling and stumbling could be removed from areas of high usage. Rules could be instituted such as "no running" except during approved activities. One way to avoid some insect stings is to attend camp when the insects are less prevalent, such as late fall and winter. Other ways to prevent insect stings may include the avoidance of dark clothing, and sweet smelling soaps and perfumes.

Injuries occurred 57.7 percent of the time during unsupervised activities and 42.3 percent of the time during supervised activities. Considering that much of the participants day is supervised, a disproportionate amount of injuries occur during unsupervised activities (2, 16). Supervised activities accounting for five percent or more of all injuries apiece were daily routine, games and sports, hiking and climbing, and arts and crafts. Both safety measures, and increased supervision may decrease injuries in all four of these areas. Safety equipment and teaching safe use of equipment may reduce injuries in arts and crafts activities, and during games and sports. Increased supervision may also reduce injuries during daily routine activities, and during hiking and climbing. Unsupervised activities accounting for 30, 10, and 10 percent of all injuries respectively were walking or running, daily routine, and horseplay. Injuries occurring while participants are walking or running unsupervised may be reduced by instituting a "no running" rule and supervising the participants to assure that the rule is obeyed. Injuries which occur during daily routine activities, and horseplay might be reduced by closer supervision during the periods in living/sleeping quarters, meal time, and free periods.

The nature of injuries which occurred showed three categories which constituted the majority of all injuries. Cuts or punctures accounted for 47.9 percent, with bruises, and other or unknown causes around 20 percent each. These three types of injuries accounted for approximately 90 percent of all injuries occurring, therefore the first aid personnel and facilities should be equipped to handle injuries of these matters. These findings agree closely with the findings of Otto's (24) study which lists cuts/lacerations, sprains, and bruises/scrapes as accounting for the majority of the injuries occurring in the resident camps surveyed.

The overall frequencies of injuries which occurred in this resident outdoor education program can have implications for the administration in terms of the program, site, and evaluation. Administrative standards (35,36) listed in the literature review include adequate first aid facilities and personnel under the facilities and staffing criteria. The findings of this study indicate that Camp Joy's facilities and personnel are equipped to handle the injuries aforementioned (16). In terms of program, the suggested standards (35,36) list safe equipment, facilities, and skilled leaders as safety factors which should be observed. The findings of this study indicate activities which have elevated injury rates and might be considered in future program planning to insure the safety of the participants in this resident outdoor education program as much as possible. In terms of site, the suggested standards (35,36) include building maintenance, and site inspection to identify risks, establish regulations, provide protection, and eliminate hazards where possible. The findings of this study indicate locations where the highest injury frequencies have occurred. These aforementioned locations should be specifically inspected for hazards which may have led to higher injury rates in these locations. In terms of evaluation, the resident outdoor education administrators should consider all locations, events, and activities which have high injury frequencies, and inspect them for potential risks, and hazards so protection may be provided wherever possible.

Injury frequencies were described by season in terms of both location of the injury, and event causing the injury. These findings revealed locations and events which are significant on a seasonal basis. In terms of location, injuries that occurred in the fall were most frequent on the general campgrounds, in the winter injuries occurred mainly in the living

quarters, and in the spring the trails had the highest injury rate. The general campgrounds may have a higher frequency of injuries in the fall because student/teacher relations are still developing. Once student/teacher relations have more time to develop, as in the winter or spring, the teachers may be more able to predict student behaviors which may cause injuries and prevent them. In the winter more injuries might occur in the living quarters because colder weather may dictate that more time is spent indoors. In the spring wetter weather may increase the number of injuries which occur in slippery areas such as trails. These locations should merit special attention in identifying risks, hazards, and protection of the participants seasonally.

In terms of events causing injuries, both falling/stumbling and insect stings are the highest causes of injuries in the fall and spring. These events indicate that while falling/stumbling is a prevalent cause of injury year round, insect stings might be somewhat avoided in the winter. Overall, more injuries occurred in the fall than in winter or spring. In the fall 29.6 percent of all injuries occurred when only 20.7 percent of the participants were in attendance. Both the winter and spring have slightly lower percentages of injuries than percentages of participants attending the resident outdoor education program. These differences could be due to several factors. For example, student/teacher relations may be less developed in the fall as previously discussed. Because of this, teachers may not be as practiced in identifying potential problem areas in the fall. Also, the winter may have lower overall injury rates due to the lack of insect stings in this period. The spring may have a lower injury rate due to more developed student/teacher relations. These seasonal differences may be of consideration to school administrators and teachers who are choosing a season for their school to attend Camp Joy's resident outdoor education program.

Injury frequencies were described by supervised/unsupervised activity in terms of location of the injury, and event causing the injury. In terms of

location, injuries occurring in supervised activities were of greatest frequency on the trail, in the living quarters, and in sports or recreational areas. Injuries that occurred during unsupervised activities were most frequent on the general campgrounds, on the road or highway, and in the living quarters. These results indicate that locations for supervised activities with high injury frequencies need to be inspected for potential risks or hazards and steps should be taken to reduce these risks and hazards where possible. Locations where injuries occur frequently during unsupervised activities should be both inspected and considered for closer supervision because fewer injuries occurred in supervised areas.

In terms of events occurring in both supervised and unsupervised activities injuries were frequently due to falling/stumbling, and insect stings. During supervised activities events likely to cause injury were contact with a sharp object, use of a tool, or other causes. During unsupervised activities collisions with persons or objects were more frequent as well as being struck by a person or a missile. These results indicate that supervised events having high injury frequencies should be inspected for risks and hazards, and safety measures should be taken where possible. Unsupervised events that show higher injury rates could probably be reduced by increased supervision that could discourage participants from fighting and throwing things.

Illnesses

The overall frequencies for illnesses shown in Table 3 reveal several factors about the natures of illnesses which occurred during the resident outdoor education program. There was a disproportionately high frequency of illnesses occurring in females in comparison to males. Females accounted

for 63.8 percent of the illnesses, and only 46.3 percent of the total participants. There is no obvious explanation for this difference except that perhaps it is less popular for males to visit the nurse when ill than for females.

There were very few occurrences of infectious or inflammatory disease, and toxic diseases when participants attended the resident outdoor education program. Only four cases were found among the 1,271 participants observed so these types of illnesses should not be of major concern to the resident outdoor education administration.

Allergic diseases, however, accounted for 57.7 percent of all illnesses. the most prevalent allergic illnesses were poison ivy, hives or rash, and asthma. Of these illnesses, poison ivy is the only one which could be easily prevented. In order to reduce the number of poison ivy cases campers should be taught about the plant, it's locations, and it's potential hazards. Asthma and hives are both due to environmental circumstances which are beyond the resident outdoor education administration's control.

Other conditions accounted for 36.2 percent of all illnesses. Undiagnosed conditions such as fever and vomiting were the most prevalent causes of illness caused by "other conditions" at 25.9 percent. Homesickness which accounted for 10.3 percent, was the only "other condition" that was frequent. Undiagnosed illnesses are probably due to viral or bacteria infections which are difficult to prevent. General measures to reduce this type of illness would be insuring that participants had adequate rest, and wore proper clothing during the resident outdoor education program. Homesickness is a psychological condition for which there is no prevention outside of insuring that the participant is busy and enjoying his or her stay at the resident outdoor education center (26).

The overall frequencies of illnesses occurring in Camp Joy's resident outdoor education program have several implications. Otto (24) suggested four methods by which resident outdoor education staff could potentially reduce illnesses including: prevention of fatigue, proper clothing and hygiene, early recognition of symptoms, and participant satisfaction. Both the resident outdoor education center and the school administration should alert staff and teachers of these criteria which may reduce the frequencies of illnesses. Another implication concerns the nature of illnesses that the resident outdoor education program should be prepared to deal with. The resident center should have adequate personnel and facilities to accomodate the participants who become ill. Some type of infirmary facility that allows for isolation of ill participants is necessary to prevent both contamination of other participants and exposure of other participants to the ill. A registered nurse or trained person with a minimum of Red Cross Standard First Aid should be available to diagnose and treat illnesses.

Illness frequencies were described by season in terms of the nature of the illness. Infectious or inflammatory diseases, and toxic diseases were not considered because of their low frequencies. In terms of allergic diseases, illnesses in the fall were most likely to be asthma, in the winter hives or rash was most frequent, and in the spring poison ivy was the most frequent. In the fall overall frequency of allergic disease was comparable to the number of participants in the resident outdoor education program. Allergic diseases which occurred in winter were only 27.3 percent while 36.7 percent of the participants were in attendance. The spring showed a large increase in allergic diseases with 48.5 percent occurring when 39.1 percent of the participants attended. These frequencies indicate that winter is the best time to avoid

allergic diseases and spring is the season when they are most likely to occur in the resident outdoor education program. These seasonal differences may be of importance to school administrators and teachers who are choosing a season for their school to attend a resident outdoor education program.

In terms of "other conditions" illnesses of undiagnosed nature are the most frequent type that occurred in the fall, winter and spring. Overall illnesses caused by "other conditions" were lowest in the fall when 14.3 percent occurred when 24.2 percent of the participants were in attendance. In the winter the incidence of these illnesses was 33.3 percent, which was similar to the frequency of participants. The spring showed an increase in illnesses due to "other conditions" with 52.4 percent in occurrence when 39.1 percent of the participants attended the resident outdoor education program. These frequencies are fairly consistent with those for allergic diseases. They indicate that fall is the best time to avoid illnesses related to other conditions, and that the spring has more of these types of illnesses than either fall or winter. Again, these seasonal differences may be of importance to school administrators and teachers who are selecting a season for their school to attend a resident outdoor education program.

Conclusions

The conclusions drawn from this study that contribute to the knowledge about injuries and illnesses at Camp Joy are:

1) Overall, injuries and illnesses occurring among the 1,271 participants were very few.
2) Injuries that occurred during a resident outdoor education program were more frequent in male than in female participants.
3) More injuries occur during unsupervised activities than during supervised activities.

4) More participants are injured during the fall than in the winter or the spring.

5) Most injuries, while of potentially serious nature, were minor cuts or punctures, bruises, and of other types.

6) Illnesses that occur during the resident outdoor education program are more frequent in female than in male participants.

7) More illnesses occur among participants in the spring than in the fall or winter.

8) The majority of illnesses which occur during the resident outdoor education program are allergic diseases such as asthma, poison ivy, and rash or hives, and illnesses of other conditions such as undiagnosed fever or vomiting.

Recommendations

Based on the discussion of results and conclusions drawn, a set of recommendations is presented. These recommendations are divided into two parts: recommendations for further research, and implications for Camp Joy's resident outdoor education program.

Further Research

Recommendations for further research on injuries and illnesses in resident outdoor education programs include:

1) Injury and illness evaluations such as the one presented in this study should be a part of the evaluation of resident outdoor education programs.

2) Injury and illness studies of this nature should be extended to other resident outdoor education programs in Ohio to see if the results of this study are consistent with other programs.

3) Extend injury and illness studies into the school systems to determine whether a higher rate of injuries and illnesses occurs in the public schools of at resident outdoor education centers.

4) Apply this method of injury and illness evaluation to any resident camping program that wishes to evaluate the safety and health aspects of their program.

Implications

This study has evaluated the injuries and illnesses that occurred in Camp Joy's resident outdoor education program during the 1979-1980 school year. Overall, Camp Joy's resident outdoor education program had very few injuries and illnesses occurring in the sample population. Among the sample population of 1,271 participants only 71 injuries and 58 illnesses occurred, and none of these were serious enough to cause a life-threatening situation. The camp's administration may wish to consider the following recommendations in order to further enhance the safety and health aspects of their program:

1) Six locations should be examined for both natural and man-made site hazards through the following methods: identification of risks; establishment of regulations; provision of protective devices; and elimination of hazards where feasible (35).

   The six areas include:

   a. general campgrounds,
   b. living and sleeping quarters,
   c. trails,
   d. road or highway area, and
   e. sport or recreational fields and courts

2) The following activities should be inspected for adequate supervision and proper use of available safety equipment:

   a. games and sports,
   b. hiking and climbing, and
   c. arts and crafts.

3) The following activities which often take place unsupervised merit closer supervision:

   a. daily routine,
   b. walking or running, and
   c. horseplay

4) In order to reduce illnesses the staff and teachers should be aware of the following items:

   a. the identification and locations of poison ivy, and the need to make these known to participants.
   b. illnesses may be reduced by the prevention of fatigue; use of proper clothing; early recognition of symptoms; and participant satisfaction (24).

This study may also have implications for other resident outdoor education programs. The low frequencies and minor nature of the injuries and illnesses which occurred in the sample population may show that fears concerning the dangers of resident outdoor education programs may be unfounded. Further studies evaluating the safety and health of resident outdoor education programs will be necessary before broad generalizations can be made.

LITERATURE CITED

1. Administrator's Environmental Education Evaluation Manuel. Vermillion. South Dakota: South Dakota University, 1971.

2. Barnheiser, Kent. Director, Y.M.C.A. Camp Kern, Oregonia, Ohio, Personal Communication, 1981.

3. Bottomly, Forbes. Outdoor Education Curriculum Guide: Grade 6. Lakewood, Colorado: Jefferson County Public Schools, 1963.

4. Bristor, James L. An Analysis of the Attitudes of Resident Camp Administrators Regarding Critical Problems in Resident Camping. Ph. D. Disertation, Indiana University, 1971.

5. Densmore, Tom, et. al. Sixth Grade Outdoor Education Program: Outdoor Curriculum Guide. New Jersey: Dixon Public Schools, 1978.

6. Donaldson, George W. Planning for Resident Outdoor Education: Taft Campus Occasional Paper No. VIII. Northern Illinois University, 1972.

7. Donaldson, George W., and Oswald H. Goering. Outdoor Education: A Synthesis. New Mexico: New Mexico State University, 1972.

8. Freund, Dean. Worthington Public Schools Outdoor Education Coordinator, Personal Communication, 1981.

9. Hammerman, Donald R. Historical Background of Outdoor Education: Taft Campus Occasional Paper No. XII. Oregon: Northern Illinois University, 1974.

10. Hammerman, Donald R. Outdoor Education: It's Role in Contemorary Education. Oregon: Northern Illinois University, 1974.

11. Hammerman, Donald R. et. al. Research in Outdoor Education: Summaries of Doctoral Studies. Oregon: Northern Illinois University, 1969.

12. Hammerman, Donald R. et. al. Research in Outdoor Education: Summaries of Doctoral Studies. Washington D.C.: AAHPER Press, 1973.

13. Hugg, John. State of Ohio Environmental Education Consultant, Personal Communication, 1981.

14. Jennings, Audry. American Camping Association, Ohio Section President. Personal Communication, 1981.

15. Kirk, John J. Outdoor Education: It's Origin and Purpose. Address delivered at the Conference on Outdoor Education: Ontario, Canada, 1968.

16. Knight, Gene. Director of Camp Joy, Cincinnatti, Ohio, Personal Communication, 1981.

17. Kramer, Edward. Director of Grant Nature Center, Centerville, Ohio, Personal Communication, 1981.

18. Lisella, Frank S., and Wilma G. Johnson. "Surveys Indicate That Camps Have Low Mortality Rates: Disease Control Center Makes Study of Causes," Camping Magazine 52 (May 1980): 32-36.

19. Lucas, Arthur M. Environment and Environmental Education: Conceptual Issues and Curriculum Implications. Ph. D. Dissertation, The Ohio State University, 1972.

20. Lucas, Arthur M. "Science and Environmental Education: Pious Hopes," Studies in Science Education 7 (1980): 1-26.

21. Means, Elizabeth A. "Guidelines for Camp Health Care," Camping Magazine 52 (May 1980): 29-30.

22. Mickolic, Larry et. al. Outdoor Education: Criterea for Relationships Between Camp and School in Planning for an Outdoor Education Program. Washington D.C.: U.S. Department of Health, Education, and Welfare,1970.

23. Mosher, Ned. Outdoor Education Coordinator for Westerville City Schools, Personal Communication, 1981.

24. Otto, Jean. "10 Most Recurring Camp Illnesses," Camping Magazine 52 (May 1980): 31, 36.

25. Outdoor Education: A Guide to Site Planning and Implementation of Programs. Texas: Texas Educational Agency, Austin Division of Curriculum Development, 1976.

26. Oxford, Gale B. A Study of Outdoor Education and It's Objectives as a Basis for Determining Current Trends. Research paper, presented to Dr. Phyllis Ford for RPM 506, 1973.

27. Rosenstein, Irwin, and George W. Donaldson. Outdoor Education: A Guide for Planning Resident Programs. New York: Albany Education Department, 1972.

28. Roth, Robert E., and Stanley L. Helgeson. A Review of Research Related to Environmental Education. ERIC Information Analysis Center for Science, Mathematics, and Environmental Education, Columbus, Ohio, 1976 (ED 135 647).

29. Roth, Robert E. A Review of Research Related to Environmental Education, 1973-1976. ERIC Information Analysis Center for Science, Mathematics, and Environmental Education, Columbus, Ohio, 1976 (ED 135 647).

30. Steinbrenner, Karin, Norman H.C. Nie, Hadlai Hull, Jean G. Jenkins, and Dale H. Bent. Statistical Package for the Social Sciences (SPSS). U.S.A.: McGraw Hill Co., 1975.

31. Swan, Malcom, et. al. Research In Outdoor Education: Summaries of Doctoral Studies. Washington D.C.: ARAPC Press, 1978.

32. Szuhy, Donna. Environmental Education Specialist, Ohio Department of Natural Resources, Columbus, Ohio, Personal Communication, 1981.

33. Untitled artical by the American Camping Association, recieved from Audry Jennings (14). Indiana: American Camping Association, 1981.

34. Van der Smissen, Betty. Research, Camping, and Environmental Education: Pennsylvania State HPER Series No. 11. Pennsylvania: Pennsylvania State University, College of Health, Physical Education, and Recreation, 1976.

35. Walch, Shirley, et. al. Standards: American Camping Association with Interpretations. Indiana: American Camping Association, 1976.

36. Youth Camp Safety and Health: Suggested State Statutes and Regulations. Georgia: Center for Disease Control (DHEW/PHS), Atlanta, 1977.

APPENDIX A

SPECIFIC INFORMATION

A separate record for each accident recieving attention from either a registered nurse or a medical doctor.

1. Code Number_____-_____ 2. Male_____ Female_____

I. INJURIES

3. Location of Injury

___01 Sleeping/Living quarters
___02 Dining Area
___03 Shower/Toilet
___04 Other Building(Specify)
_____
___05 Arts/Crafts Area
___06 Nature Area
___07 Trail
___08 Sport or Recreational Field or Court
___09 Campfire/Cookout Area
___10 Road/Highway
___11 General Campgrounds
___12 Transportational Vehicle
___13 Other(Specify)
_____

4. Type of Event Causing the Injury

___01 Falling/Stumbling
___02 Collision w Person or Object
___03 Struck by Another Person
___04 Struck by Missile
___05 Bite or Sting-Insect or Spider
___06 Bite or Wound-from Animal
___07 Contact w Heat or Flame
___08 Using a Tool(Including a Cutting Instrument)
___09 Contact w Sharp Object other than Tool
___10 Other(Specify)
_____

5. Activities at the Time of the Incident Causing Injury

A. Supervised

___01 Trail Group
___02 Arts and Crafts
___03 Transportation
___04 Hiking/Climbing
___05 Games/Competitive Sports
___06 Daily Routine(Meals, Activities in Quarters)
___07 Other(Specify)
_____

B. Unsupervised

___08 Fighting
___09 Horseplay
___10 Walking/Running
___11 Daily Routine(Meals, Activities in Quarters)
___12 Other(Specify)
_____

6. Injury Data (check one for each part injured)

		Head/ Neck	Eye	Upper Limb	Lower Limb	Torso	Other/ Unknown
bruise	1	_____	_____	_____	_____	_____	_____
Burn	2	_____	_____	_____	_____	_____	_____
Fracture	3	_____	_____	_____	_____	_____	_____
Cut/Puncture	4	_____	_____	_____	_____	_____	_____
Sprain/Dislocation	5	_____	_____	_____	_____	_____	_____
Other/Unknown	6	_____	_____	_____	_____	_____	_____

(OVER)

II. ILLNESSES

7. Diagnosis(Check no more than one)

A. Infectious or Inflammatory Disease

___01 Respiratory Infection
___02 Gastroenteritis
___03 Dental(Toothache,etc.)
___04 Earache or Ear Infection
___05 Appendicitis
___06 Miscellaneous/Other(Specify)

B. Allergic Diseases(asthma, pollen, foods, etc.)

___(Specify)_____

C. Toxic Disease(insect bites, poisoning, drug use, etc.)

___(Specify)_____

D. Other Condictions not Listed in A,B,orC-Include Signs and Symptoms

___01 Psychological Disorders-Especially Homesickness
___02 Undiagnosed Condictions-Fever of Unknown Cause, Fainting, etc.
___03 Miscellaneous Disorders/Other-Nose Bleeds, Indigestion, etc.
Signs and Symptoms, if Applicable:_____

8. Who Made the Diagonosis?

___01 Physician
___02 Nurse
___03 Teacher
___04 Other(Specify)_____

Completed by:_____

Source: This form is adapted from "Camper Injury and Illness Report," Youth Camp Safety & Health: Suggested State Statute & Regulations U.S. Department of Health, Education, and Welfare /Public Health Service/Center for Disease Control, August 1977